UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF ENVIRONMENTAL CLEANUP

MEMORANDUM

DATE: August 5, 2016

SUBJECT: Updated Groundwater Source Control Evaluation
Gunderson LLC Facility
ECSI #1155
May 31, 2016

FROM: Eva DeMaria, Remedial Project Manager

TO: Alex Liverman, Project Manager
Oregon Department of Environmental Quality

Following are the United States Environmental Protection Agency's (EPA's) comments on the May 31, 2016 Updated Groundwater Source Control Evaluation for the Gunderson LLC facility. Cascadia Associates, LLC on behalf of Gunderson LLC prepared the Groundwater Source Control Evaluation (SCE). The Gunderson LLC facility is located at 4350 NW Front Avenue, Portland, Oregon and is listed in Oregon Department of Environmental Quality's (DEQ's) cleanup program as ECSI #1155. The site is located on the west bank of the Willamette River near River Mile 9W and adjacent to the Portland Harbor Superfund Site SDU area at that location.

EPA understands that the purpose of the updated groundwater SCE is to evaluate whether current concentrations of constituents in groundwater at the Site pose a threat to human and ecological health in the Willamette River, as described in Section 1.1 of the SCE. The SCE should also evaluate if source control measures are needed to control sources of contamination that may affect the Willamette River in a manner that is consistent with the objectives and schedule for the Portland Harbor Remedial Investigation and Feasibility Study ([RI/FS] DEQ and EPA 2005). Contaminated groundwater has the potential to recontaminate sediment after a potential future in-water action is implemented; specifically, Alternative I, which is the preferred alternative of the Proposed Plan (EPA 2016), includes dredging and capping of sediment adjacent to the Gunderson Facility. Screening of groundwater should include the preliminary remediation goals (PRGs) for Remedial Action Objectives (RAOs) 4 and 8.

EPA's comments are presented in the following sections. Comments have been separated as "Primary," which are comments that identify concerns that must be resolved to achieve the assessment's objective; "To Be Considered," which are comments that if addressed or resolved would reduce uncertainty, improve confidence in the document's conclusions, and/or best support the assessment's objectives; and "Matters of Style," which are comments that substantially or adversely affect the presentation or understanding of the technical information provided in the report.

Primary Comments on the SCE Report

1. The weight-of-evidence evaluation in the SCE should be revised to include all of the available key factors described in the *Portland Harbor Joint Source Control Strategy* (JSCS [DEQ and EPA 2005]) and Section 3.3 of the SCE; additionally, the weight-of-evidence evaluation should evaluate all constituents of concern identified for the Gunderson Facility LLC. The following bullets describe some examples of how the weight-of-evidence evaluation is incomplete:

    a. The SCE should evaluate groundwater migration pathways from the Gunderson facility to the Willamette River. Potential groundwater pathways identified in the JSCS include discharge through river sediments, discharge through leaky stormwater conveyance pipes, and discharge of constituents dissolved in groundwater to the Willamette River. For example, groundwater may be entering a leaky stormwater conveyance system and then discharging to the Willamette River. The Groundwater SCE (Shaw 2011) identified abandoned/damaged stormwater conveyance line WR-363 as one of the sources of groundwater seeps. WR-363 and other stormwater conveyance lines were not evaluated to determine their integrity or if they are below the water table. The stormwater conveyance system should be evaluated to determine if it is a pathway for contaminated groundwater to discharge to the Willamette River.

    b. Table 7, Area 2, VOCs – Data presented in the SCE does not support the statement in the weight of evidence evaluation, "Considering the absence of trichloroethylene (TCE) in groundwater from other Area 2 monitoring wells, it is clear that the overall concentration and mass of TCE migrating from Area 2 to the river are insignificant." The SCE only includes VOC data for one other Area 2 monitoring well (MW-17) over 600 feet to the southeast, which is not sufficient to support this conclusion. SMW-12 is the monitoring well where TCE was detected in Area 2 and is adjacent to Area 1, where a 1,1,1-trichloroethance (1,1,1-TCA) release occurred. As shown on Figure 6 of the SCE, in many wells where 1,1,1-TCA exceeded the screening level, TCE also exceeded the screening level in Area 1. The 1,1,1-TCA release in Area likely impacted Area 2 groundwater as shown by the detection of Area 1 constituents TCE, chloroform, and 1,1-dichloroethene. The SCE should evaluate VOCs in Areas 1 and 2 groundwater, including an estimate of contaminant mass discharging to the Willamette River. A plume map showing the extent of the VOC plume in groundwater should be provided in the SCE.

    c. Section 3.2, page 9 – This section describes that MW-22, MW-24, and MW-42 were included in the monitoring program to evaluate groundwater quality upgradient of the Site and to assess background metals concentrations at the Site. Section 3.3.2, Background Wells, describes the rationale for selecting MW-22, MW-24, and MW-42 as background locations because they are hydraulically upgradient of Gunderson's current and historical operations. Although these wells are located upgradient of the Gunderson

facility, their locations are hydraulically downgradient of the railroad line and multiple industrial facilities. Background wells should be located in relatively undisturbed areas near the Gunderson Facility and it may be necessary to use data from other studies to evaluate and determine appropriate background values for metals. A monitoring well's location upgradient of the site is insufficient rationale to determine if it is representative of background conditions. The report should describe the lithology near monitoring wells MW-22, MW-24, and MW-42, and why they were originally installed and how they were constructed, e.g., PVC or steel casing. Additional justification for selecting MW-22, MW-24, and MW-42 as background monitoring wells should be included in the SCE, including historical land use in the vicinity, hydrogeologic unit that the wells are screened in, and comparison of monitoring data at these wells with other background groundwater data. MW-22, MW-24, and MW-42 should not be considered background monitoring locations during the weight-of-evidence evaluation in the SCE without sufficient justification.

d. Section 3.3.2, page 17 – First bullet under "Manganese" describes the source of the PRG for manganese under RAO 4 as the secondary drinking water standard. Additionally, the SCE describes that the portion of the Willamette River in the Portland Harbor Superfund Site as not a drinking water source. RAO 4 has since been updated and is based on risk. The SCE implies that the PRG for manganese for RAO 4 should not be used in the weight-of-evidence evaluation because the portion of the river near the site is not being used as a drinking water source. RAO 4 for groundwater has been included for the Portland Harbor Superfund Site and is applicable to groundwater at the Gunderson Facility that is discharging to the Willamette River. The weight-of-evidence evaluation should include all PRGs in RAO 4.

e. Section 4.0, Metals, last paragraph – The conclusion that "...source control for metals in groundwater is not warranted" is not supported by data in the SCE or a weight-of-evidence evaluation. For example, Section 3.3 describes that a weight-of-evidence approach may include background information for constituents and a review of available in-water data to determine if impacted sediment or transition zone water is indicated in the area offshore of the Gunderson facility. However, in-water data is available, but not presented in the SCE. EPA's review of the in-water data indicates that arsenic was detected at three locations >25 mg/kg in sediments offshore of the Gunderson facility, with additional detections above >10 mg/kg. These detections are generally higher then analytical data up river of the Gunderson facility, as shown on Figure 1.2-14a of the Portland Harbor Feasibility Study (EPA 2016) and should be included in the weight-of-evidence evaluation.

f. Total Petroleum Hydrocarbons (TPH) compounds are chemicals of concern (COC) for the Willamette River in-water remedy and warrant evaluation in the SCE. The evaluation

should consider: (1) DEQ's standard of 1 mg/L TPH for groundwater discharging to surface water; and (2) integrate comparisons to the PRGs developed to protect the Willamette River. TPH has not been adequately characterized or evaluated to determine if source control measures are needed. As noted in Section 2.3, TPH and other chemicals have been released to the subsurface from a 1,1,1-TCA tank, Texaco pipeline, and underground storage tanks. The release locations should be presented on an SCE figure along with groundwater monitoring data. Results presented in the SCE indicate that historical releases may be an upland source of COCs for the Willamette River. The PRG for TPH C10-C12 Aliphatic (2.6 µg/L) for RAO 8 should be used in the evaluation of the groundwater pathway for migration of COCs to sediment and surface water. Groundwater samples should be analyzed by an appropriate method that provides for a direct comparison to the PRG for C10-C12 Aliphatic hydrocarbons. TPH-diesel and TPH motor oil were detected in many wells adjacent to the Willamette River, as presented in Table 6. One example includes TPH-diesel being detected in the most recent round of groundwater monitoring at MW-77 at a concentration of 577 µg/L; MW-77 appears to be located approximately 50 to 75 feet away from the Willamette River on Figure 2. The evaluation of TPH should be completed for all three areas and include current data for monitoring wells adjacent to the Willamette River. Additionally, TPH degradation may need to be evaluated to determine if degradation is contributing to reducing conditions in groundwater and mobilizing arsenic and other metals that are COCs for the Willamette River.

g. VOC concentrations in groundwater are not adequately characterized or evaluated in the SCE. The SCE does not present any VOC concentrations for Area 3 or describe why monitoring does not need to be conducted in the area. Section 3 reports that Area 3 was used for ship dismantling and automobile recycling with known soil impacts. Groundwater monitoring wells in Area 3 should be analyzed for VOCs since TPH-diesel and TPH-motor oil results in Table 6 indicate a release(s) occurred in the area and VOCs are likely to be present in groundwater. Groundwater results for Area 2 should include more locations then SMW-12 and MW-17 because SMW-12 has had consistent detections of VOCs above the PRG for trichloroethene (TCE) and tetrachloroethene (PCE).

   Although VOC trends are decreasing in Area 1, source controls may be needed and should be evaluated outside the context of performance monitoring for actions completed in Area 1. For example, the PRG for RAO 4 for vinyl chloride is 0.02 µg/L and vinyl chloride was detected at a concentration of 1.10 µg/L in MW-51 on September 15, 2015. MW-51 is located adjacent to the Willamette River and may be an indicator that source controls are necessary.

2. The SCE should evaluate if chlorinated compounds will discharge to the Willamette River above the PRGs for RAOs 4 and 8. This may include evaluating whether degradation results in the generation of non-toxic constituents like ethane at a rate sufficient to prevent discharge of chlorinated compounds to the river at unacceptable levels. For example, TCE and vinyl chloride were detected in MW-51 (a monitoring well less than 150 feet away from the Willamette River) at concentrations of 0.970 and 1.10 µg/L, respectively, in September 2015. These concentrations are above the PRGs for RAO 4 for TCE and vinyl chloride of 0.6 and 0.02 µg/L, respectively, and the groundwater elevation map in Appendix A indicates that groundwater is discharging to the Willamette River.

3. The SCE screens chemical or metals concentrations against JSCS SLVs and PRGs interchangeably without much rationale. Constituents in groundwater should be screened against the PRGs for RAO 4 and RAO 8 at locations where groundwater is likely to discharge to the Willamette River.

4. Area 1 groundwater monitoring does not include data for metals concentrations in monitoring wells closest to the Willamette River. The most recent metals data for wells near the Willamette River in Area 1 should be included in the SCE to determine the need for further evaluation or source control.

   Section 3.2, page 9 – Historic monitoring results (e.g., prior to 2012, related to historical releases) should be included to support the SCE conclusions. It is understood that previous groundwater samples were collected with a bailer and they may be biased high for some constituents, but the data should still be considered to characterize groundwater and as part of the SCE in accordance with JSCS guidance.

5. Section 3.3.2, page 19 –The SCE should evaluate the significantly higher exceedance ratios for arsenic in wells nearest the Willamette River at the middle of the facility. SCE Section 3.3.2 compares exceedance ratios to hydraulically upgradient wells MW-22, MW-24, and MW-42, but dismisses the significant variation. For example, the maximum exceedance ratio for arsenic at MW-66 was 711, but the maximum exceedance ratio for arsenic at hydraulically upgradient wells was an order of magnitude lower at MW-23 and MW-24 at 28 and 34, respectively. The SCE should evaluate the groundwater pathway for migration of arsenic and manganese to sediment and surface water using PRGs from RAOs 4 and 8. Arsenic concentrations are evaluated in the sediment surface offshore of the Gunderson Facility, but are generally not elevated immediately up river, as shown in Figure 1.2-14a of the Portland Harbor Feasibility Study (EPA 2016). The regional background groundwater concentrations for arsenic for the Willamette Valley (USGS 1999) should not be used as a line of evidence in the SCE. The values in that report are not representative of background conditions for the Portland Harbor Superfund Site area. Additionally, the study acknowledges that “anthropogenic sources of arsenic can be

significant in some settings" (USGS 1999) and anthropogenic sources of arsenic should not be considered background.

To Be Considered Comments

1. Section 2.2, page 3 – The SCE does not include much information regarding the hydrogeology of the Gunderson facility, which makes it difficult to evaluate the transport of constituents in groundwater. Additional information on the site-specific geology/hydrogeology should be included in the SCE to support the evaluation of the migration of constituents in groundwater.

2. Section 3.3.1, groundwater samples from Area 1 should be analyzed for PAHs or the SCE should explain why PAHs are not a constituent of potential concern in an area where a release has occurred. PAH samples should be collected and analyzed using the methods that will result in detection limits below or close to the PRGs; many of the non-detects reported in the SCE are 1 to 3 orders of magnitude above the PRGs. In all Areas, PAHs should be characterized in monitoring wells closest to the Willamette River. For example, in Area 3 TPH-diesel was detected at a concentration of 577 µg/L at MW-77 during the most recent round of groundwater monitoring, but PAHs were not analyzed in groundwater at MW-77. PAHs and TPH were detected in wells hydraulically upgradient of MW-77 exceeding screening level values. Therefore, groundwater should be monitored for all constituents of potential concern at the closest monitoring well to the Willamette River.

3. Section 3.3.2, page 17 – Arsenic, second bullet states, "As shown in Figures 4 and 5, arsenic is ubiquitous in groundwater at the Site (90 out of 95 total arsenic concentrations detected in samples exceeded the JSCS SLV), which indicates that a subsurface source of arsenic at the Site is unlikely to have caused the concentrations of arsenic detected in groundwater. Instead, this further supports that it is likely that arsenic concentrations detected at the Site are indicative of high background concentrations of arsenic in regional groundwater." These statements are not supported by the evaluation of exceedance ratios presented in Section 3.3.2.

4. Appendix A – an explanation should be included in the SCE to describe why some groundwater elevations were not used to generate groundwater contours. It is unclear why the groundwater elevations vary significantly over a small area (e.g., MW-43 and MW-50). Including monitoring well construction information in the SCE would help explain groundwater elevations.

Matter of Style

1. Section 3.3.3, page 20 – The concentration trend evaluation describes that the treatment and post-treatment data set were used for the statistical evaluation of VOC concentration trends. Section 4.0, VOCs states, "…VOC concentrations are stable to decreasing, following discontinuation of groundwater extraction and treatment in July 2014." This statement should be

revised to clarify that trends represent concentrations during pump and treat and post-treatment monitoring.

References

DEQ and EPA. 2005. Portland Harbor Joint Source Control Strategy. December.

EPA. 2016. Superfund Proposed Plan for Portland Harbor Superfund Site. June.

Shaw. 2011. Groundwater Source Control Evaluation Gunderson Facility, 4350 NW Front Ave, Portland, OR. April.

USGS. 1999. Arsenic in Ground Water of the Willamette Basin, Oregon.